

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF AGRICULTURAL, EARTH AND ENVIRONMENTAL SCIENCES
DISCIPLINE OF DIETETICS & HUMAN NUTRITION
EXAMINATION: NOVEMBER 2012
SUBJECT, COURSE & CODE: DIET 237 - P2
WEIGHT, DIABETES, HEART DISEASE

External Examiner: Dr K Pillay
Internal Examiner: Mrs S Ogilvie

DURATION: 3 HOURS

TOTAL MARKS: 150

NOTE: THIS PAPER CONSISTS OF NINE (9) PAGES AND APPENDIX A THREE (3) PAGES AND APPENDIX B THREE (3) PAGES
PLEASE CHECK THAT YOU HAVE THEM ALL.
PLEASE WRITE LEGIBLY AND ANSWER ALL QUESTIONS IN INK. ANSWERS WRITTEN IN PENCIL WILL NOT BE MARKED

QUESTION 1 IS COMPULSORY, YOU MAY ANSWER ANY TWO (2) OF THE OTHER THREE (3) QUESTIONS.

QUESTION 1 – COMPULSORY

Bernard Thompson, a 41 year old environmental scientist was diagnosed with Type 1 diabetes at the age of 16 years. He was on Protaphane and Actrapid for many years. His current medications include: Lantus 40 units at bedtime, Humalog 8 units TDS, Glucophage, Crestor, ½ aspirin and Ramace (ACE inhibitor). He is not very active.

He has in the last year developed some peripheral neuropathy, erectile dysfunction and eye changes. He tends to have regular hypoglycaemic attacks and has developed hypoglycaemia unawareness. As a result he tends to eat to prevent “hypos”.

He monitors his blood sugars regularly and they usually range from 4 – 12 mmol/l but can fluctuate from 1.9 – 23 mmol/l.

You get the following additional information:-

Height	187 cm
Weight	99 kg
Total cholesterol	5.8 mmol/l
LDL	2.4 mmol/l
HDL	1.1 mmol/l
Triglycerides	4.6 mmol/l
HbA1c	7.8 %

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From his diet history a typical day's food intake is as follows:

Breakfast	1 cup muesli ½ cup low fat milk 2 Tbs raisins 1 tsp sugar
10 am	1 can Coke zero
Lunch	90 g cooked chicken breast (no skin) 3 slices low GI bread 3 tsp regular margarine 4 tsp regular mayonnaise 1 cup lettuce, tomato & cucumber salad 1 small banana Water
3 pm	Coffee + 50 ml low fat milk
Supper	150 g rump steak, grilled 200 g baked potato 1 cup baked butternut ½ cup boiled green beans 2 tsp regular margarine for potato
10 pm	1 slice low GI bread 1 tsp regular margarine 1 Tbs jam 1 cup Milo (4 tsp Milo powder, hot water + 125 ml low fat milk)

- 1.1 Calculate his BMI and classify. (1)
- 1.2 Calculate his IBW. (1)
- 1.3 What percent overweight is he? (1)
- 1.4 Calculate his current energy and macronutrient requirements using the Schofield equation and an appropriate PAL.
Make suitable adjustments for weight loss if required. (6)

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- 1.5 Analyse his diet history using exchanges.
Fill your answer in on the table Appendix A1. (12 x 1/2 = 6)
- 1.6 Explain the difference between Protaphane and Lantus.
Do not include onset, peak and duration of action. (2)
- 1.7 If his insulin: CHO ratio is 10 how much insulin would he need for a snack of:
1 muffin + 1 glass of milk + 1 small banana? (1)
- 1.8 You have calculated his insulin sensitivity factor to be 2.4.
If his blood glucose reading was 13.2 mmol/l and his target is 6.0 mmol/l
what correction dose of insulin is needed? (1)
- 1.9 Why would his doctor have added Glucophage to his medications?
Explain how Glucophage works and the best way to take it to minimise
gastrointestinal problems. (8)
- 1.10 What group of drugs does Crestor belong to and explain how it exerts its effect? (4)
- 1.11 Why would aspirin be prescribed for a diabetic? (1)
- 1.12 Explain what the HbA1c test is, and why it is important. (7)
- 1.13 Discuss with him the possible reasons for his hypoglycaemia unawareness. (3)
- 1.14 He is concerned about his feet as he often has a sensation of pins and needles.
Discuss peripheral neuropathy in detail. (8)

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ANSWER ANY TWO (2) OF THE FOLLOWING THREE (3) QUESTIONS.

QUESTION 2

Demetrio a 24 year old of Portuguese origin has been referred to you for dietary counselling. For the last month he has been suffering from nausea, fatigue and loss of appetite so he consulted his doctor. The doctor did a number of blood tests and diagnosed him with a fatty liver and metabolic syndrome. He has recently had a lot of work stress.

His diet history reveals he has extremely bad eating habits which started in childhood as his mother allowed him to eat “takeaways” most days.

He usually eats no breakfast or has a McDonald’s meal plus large orange juice. Lunch consists of Nandos chicken and chips or Pizza and supper is often just cake. He has 1½ litres Coke daily. He hates vegetables and occasionally eats fruit and salad. He drinks 7 cups coffee with 3 teaspoons sugar in each cup daily. He does not drink alcohol, but smokes 20 cigarettes per day. The only exercise he does is play soccer twice per month

During your interview with him you gather the following information:

Height	172 cm
Weight, current	92.5 kg
Waist circumference	118 cm
Blood pressure	150/110 mmHg
Total cholesterol	7.8 mmol/l
LDL	3.5 mmol/l
HDL	0.7 mmol/l
Triglycerides	5.2 mmol/l

- 2.1 Calculate his BMI and classify. (1)
- 2.2 He is very upset when the doctor tells him that he has metabolic syndrome and that his fatty liver is due to excess alcohol intake. Explain to him what metabolic syndrome is and why the doctor has diagnosed this. Do you agree with the doctor’s explanation for his fatty liver? (8)
- 2.3 From the information you have been given on Demetrio can you identify any risk factors for developing metabolic syndrome that he has. (1x4 =4)

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- 2.4 Discuss with him what associated conditions he could still develop. **(1x6 = 6)**
- 2.5 Considering his blood pressure readings are there any dietary and behavioral changes you would recommend? **(11)**
- 2.6 List the four groups of drugs available to lower blood cholesterol and triglycerides. Do not give trade names of drugs. List two side effects of each group. **(12)**
- 2.7 The presence of the metabolic syndrome is considered to be a risk factor for the development of CVD. Atherosclerosis leads to CVD and is caused by damage to the endothelium of the arteries. List all the factors which can cause endothelial injury. **(8)**

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QUESTION 3

Mr Pillay recently had a lipogram done as he has a strong family history of CHD. He is 48 years old, weighs 85 kg and is 171 cm tall. His results are as follows:

Total cholesterol	7.2 mmol/l
LDL	4.5 mmol/l
HDL	0.7 mmol/l
Triglycerides	2.3 mmol/l

You take the following diet history:-

Breakfast	2 slices brown bread 2 tsp butter 1 small banana 1 cup black tea with a slice of lemon
Lunch	2 white rolls 4 tsp butter 60 g cheddar cheese 1 small apple
Supper	120 g chicken curry (dark meat with skin) 35 ml sunflower oil (per serving in curry) 1 cup cooked white rice ½ cup grated carrot salad ½ cup tomato, lettuce and cucumber salad 2 slices brown bread 2 tsp butter
Snack	50 g packet peanuts, salted 1 cup full cream milk

- 3.1 Discuss his lipogram results with him, explaining what values he should aim for. (4)
- 3.2 He understands what total cholesterol means but asks you to explain the meaning of the other tests. Discuss all lipoproteins in detail with him. (13)
- 3.3 Calculate his current energy and macronutrient intake using exchanges. (5)
Fill your answer in on the table Appendix A2.

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- 3.4 Analyse the fat content of his diet. Take his total energy as 10500kJ. Show the breakdown of fats in his diet and calculate the energy contribution (percentage) of fat to the diet as well as the energy contribution of each type of fat. (Assume 3 SF from cheese, 4 SF from chicken and 1.5 SF from milk)
Fill your answer in on the table Appendix A3. (6)
- 3.5 Calculate and interpret his BMI. (1)
- 3.6 Calculate an appropriate energy requirement for him. Use the Schofield equation plus an activity factor of 40 %. How does this compare to his current energy intake? (4)
- 3.7 Show how you would adjust his fat intake to comply with the recommendations in the Therapeutic Lifestyle Changes Diet. Use the appropriate energy value you have calculated.
Complete the table Appendix A4. (7)
- 3.8 Looking at his diet history list the foods (no repeats) that he should change in his diet and give examples of appropriate alternatives. **Negative marking will apply (6)**
- 3.9 He says he has noticed that there are four different Flora margarines and wants to know which he should use. Explain the difference between them to him and tell him which one would be most effective in lowering his cholesterol and why. (4)

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QUESTION 4

- 4.1 Mrs Nyembezi is a 48 year old housewife with three children. Her husband works in a nearby factory. She was diagnosed with type 2 diabetes eight years ago. She was initially controlled on Glucophage only, and then Amaryl was added on a few years later. In the last six months her control has deteriorated and she has been experiencing polyuria, polydipsia and polyphagia and has lost 3.5 kg. She has missed her last two appointments at the diabetic clinic, as she did not feel it was necessary to attend. She has now developed a bladder infection so she went to the clinic. The doctor wants to change her medication to improve her control and is considering either starting insulin or adding in an incretin. You get the following additional information:-

Height	165 cm
Weight, current	92 kg
Waist circumference	90 cm
HbA1c	8.9 %
FBG	12.2 mmol/l
Random glucose	14.1 mmol/l
Urine test	negative

- 4.1.1 Calculate her IBW (1)
- 4.1.2 Explain the terms: - Polyuria
Polydipsia
Polyphagia (3x2=6)
- 4.1.3 Describe the function of Amaryl and explain why it may no longer be effective. (6)
- 4.1.4 What blood sugar lowering effect would you expect from the combination of Amaryl plus Glucophage? (1)
- 4.1.5 Do you agree with the doctor that she meets the criteria to start insulin? Discuss. (5)
- 4.1.6 She asks you to explain in detail what incretins are as she has never heard of them, and why they would benefit her. List the two categories of incretin drugs, giving one drug name for each category. Do not give side effects. (14)

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4.1.7 She asks if Knorr Pasta & Sauce can be included in her diet, as she really enjoys it. She prepares it with 125 ml full cream milk plus 3 tsp margarine. She eats half the quantity. Convert this information, per serving into exchanges.

The nutritional information is as follows:

Nutritional information	Per sachet dry product
Energy	1861kJ
Protein	16g
Carbohydrates	85g
Total Fat	4g

Fill in your answer on the table Appendix A5. (5)

4.2 Jake has been admitted into hospital and referred to you by his doctor who asks you to do a nutritional assessment. Jake is a 4½ year old boy, who is not very active, but does walk around the hospital ward. His current weight is 27 kg and height is 115cm.

4.2.1 Calculate his BMI and classify (2)

4.2.2 What is his ideal body weight? (2)

4.2.3 What percent overweight is he? (1)

4.2.4 Using the Schofield equation and a suitable activity factor calculate his appropriate energy requirement. (4)

4.2.5 Using the energy value from 4.2.4 calculate his macronutrient prescription. (3)

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